



Integrating Concept-Based E-Learning Videos to Support Teaching and Learning in Dental Education During Covid -19 Pandemic



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Abstract

The COVID-19 pandemic presented a disruption to the usual curriculum and provided time to rethink and redesign the clinical introductory course at HSDM with novel pedagogical methods. Concept-based E-learning videos were incorporated into the Foundations Continuity Clinic (FCC) course to advance teaching and learning approaches. It was an attempt to provide student focused education without disruption of the curriculum. The purpose of the study is to analyze if the concept-based E-learning videos have been effective in increasing critical thinking and have enhanced the teaching and learning approaches.

Keywords: Dental Education; Concept-based e-learning; concept video; IPE; Interprofessional education; Education methodology; Comprehensive care predoctoral dental education; Covid 19 pandemic

Problem

Covid-19 pandemic led to disruption of the curriculum for predoctoral students, as well as a reduction of pre-clinical and clinical opportunities due to the implementation of infection control precautions which limited in-person learning and decreased clinic capacities. The first semester for 1st year DMD students was taught remotely. Reduced clinical exposure made practicing the integrated medical and dental physical examination in a dental chair and learning interprofessional clinical team roles very challenging.

It became imperative to find new teaching methods to supplement dental education and maximize in-person teaching time. Solution- Concept-based e-learning videos were developed with specific objectives to - a) demonstrate the flow of the integrated medical and dental physical exam in the dental setting; b) orient and onboard students to the dental school and student teaching practice (Eg: PPE donning and doffing, sharps safety, etc.); and c) foster case-based clinical discussions using patients' compelling stories. Videos were posted on Canvas – a web-based

learning management system used by 1st year DMD and MD students to access online course materials.

Students were encouraged to watch corresponding concept videos prior to online class sessions. During class, the videos were referenced, and pertinent points were highlighted. After the completion of the course, students were asked to complete an informal online questionnaire to evaluate the effectiveness of the concept-based eLearning videos as a tool to increase critical thinking and enhance learning and understanding of topics. The study was reviewed and approved by the Institution of Review Board (IRB) of the Harvard Faculty of Medicine IRB21-0577.

Methods

Faculty input was solicited by asking for feedback in meetings after the sessions. We also solicited student input by sending out an informal survey towards the end of the academic year. The survey was sent to all first year HSDM DMD students at the end of the course to obtain the students' perspectives on the effectiveness of the concept videos. Participation was not mandatory, and a qualitative analysis was done.

The questionnaire consisted of two sections:

- a) Questions (Table 1), types of questions provided to student's post-course completion
- b) Open response section also included questions like

“What did you find most useful from the concept-based E-learning videos?”

“Would you prefer in-person sessions or concept videos for didactic learning to prepare for clinic”.



Figure 1

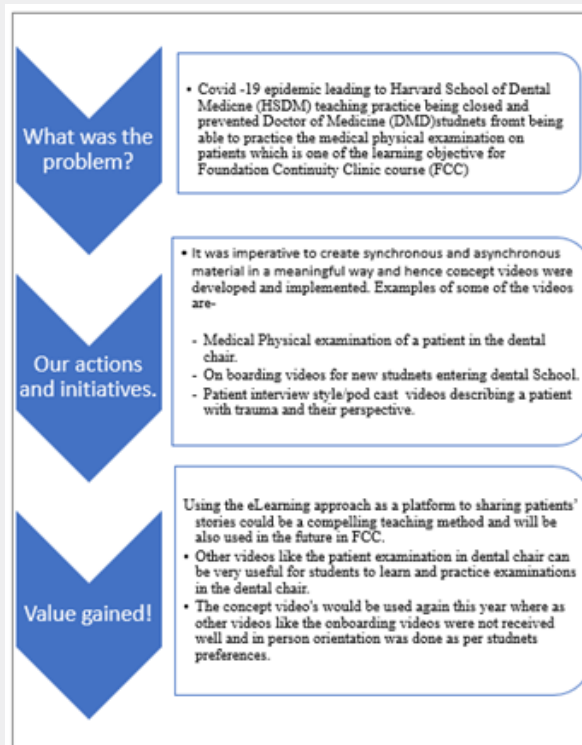


Figure 2: Summary of the implementation process of Concept based e-learning in Foundation Continuity Clinic.

Table 1: Types of questions provided to student's post-course completion.

S No.	Items
1	Concept videos increased my understanding of the topic and supported my learning.
2	These E learning concept videos helped in the long-term retention of the educational material.
3	These concept videos made access to educational material easy and could be used any time of the day when convenient, and I could go back and watch them before the clinical sessions.
4	I had the opportunity to watch them time and again, and at my own pace which helped with time management.
5	I was able to understand overall flow of the session and the video's enhanced my learning.
6	The interview and podcast style videos helped to change or enhance my views toward other health care professions.
7	After watching the concept videos, it increased my critical thinking.

Results

What went well

There was general positive feedback from both students and faculty on the concept video experience. From a faculty perspective the conversational style of the concept videos facilitated acceptance and retention of these materials. Implementing concept videos allowed students to learn how to interact with patients and navigate the clinical environment. Faculty also felt that it reduces in-person instruction time, increasing the available time for students to practice procedures and faculty to provide feedback. This initiative fostered creativity within curricula and was seen as an efficient teaching format. Students indicated that they had an opportunity to watch the concept videos at their own pace (able to pause at any time) which assisted with time management, and that the videos were easy to access and could be used any time of the day.

What did not go well

A-In the responses to the open-ended questions, the students agreed that concept videos could not replace practicing the physical exam in person, as it is significantly better to do the practical training for learning purposes. Limitations of the videos included that they were not as interactive as in-person sessions, and students were unable to ask clarifying questions about techniques or topics discussed in the videos. B- The onboarding videos used for clinic orientation, sharps, etc. We're not as well received, and students preferred in person orientation for these purposes. C-Faculty was not technologically savvy to create the concept videos and new faculty development efforts were needed. Creating these videos is time-consuming and requires coordination between the faculty creating the video content as

well as the personnel who are editing and formatting the video to make sure that the lessons and information are being conveyed correctly. Online recourses and platforms were limited, and faculty training had to be provided.

Lessons learned

Previous studies have indicated that concept-based E-learning facilitated critical thinking and problem solving with student centered teaching and learning strategy [1-4]. Our concept videos were valuable in maximizing synchronous sessions given that students had already been exposed to the concepts which allowed time to address questions. The video demonstrating the integrated medical and dental exam is being used again this year for students to learn and practice how to do a PE in the dental chair, even though the course is being taught in person this year. These concept videos helped with the delivery of the curriculum especially during the unprecedented times of a pandemic.

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